

JUN 11 1973

HISTORY

The UMA Group is a large diversified Company with seven major offices, twelve district offices and seven subsidiary companies, located throughout Canada and the mid United States.

The history of the Group dates back to the founding in 1911 in Saskatoon of a partnership by two young Queen's Engineering graduates, McArthur and Murphy. The partners hired a University of Toronto Civil Engineering graduate, J. E. Underwood, as field engineer for their first project - an electric power plant and water system - and later the same year Underwood was taken into the firm which then became McArthur, Murphy and Underwood.

In 1913 R. A. McLellan, graduate in Civil Engineering, University of Toronto, joined the Company as resident engineer for their first major project in The Pas. Following the First World War, McLellan surveyed forty miles of the Manitoba-Saskatchewan boundary running through Flin Flon.


In 1928 the firm became known as Underwood McLellan.

1952 saw the end of the partnership. The company became Underwood McLellan & Associates Limited with head office in Saskatoon, executive offices in Winnipeg and major branch offices in Toronto, Winnipeg, Saskatoon, Calgary, Edmonton and Vancouver.

The Company was incorporated with J. E. Underwood as President and five associates - Fred Small, Bill McKay, Dave Ferguson, Gerry Beaumont and Bev. Ellis - who began to acquire ownership of the new organization. F. L. Small became President in 1955 and remained in this position until 1962. W. G. McKay then became the new President of the UMA Group until 1970, at which time W. J. Adams became President.

Wholly-owned subsidiaries include:

- Spantec Limited. Incorporated in 1971. It is a project management group with headquarters in Calgary and offices in Winnipeg and Toronto. Spantec's projects include the new Royal Canadian Mint, now under construction in Winnipeg, the Imperial Oil Distribution Terminal in Calgary, the new Westroc Industries wallboard plant in Montreal and a shopping centre in North Battleford.
- Western Photogrammetry Limited. Western has production offices in Toronto and Edmonton and operates throughout Canada. It provides digital mapping and data storage for computer mapping for highways, large mapping programs for cities and aerial mapping for the mining industry.
- Nutana Properties Limited. Nutana has offices in Saskatoon, Winnipeg, Calgary and Toronto. It acts as the real estate holding arm for the UMA Group.



Digitized by the Internet Archive
in 2023 with funding from
University of Alberta Library

https://archive.org/details/UMAG1939_0000

- Prosearch Limited, another wholly-owned company, was incorporated in 1968 as a separate organization to provide services in pollution control. It is basically a laboratory facility for treatability studies, research services and process engineering pertaining to air, water and solid waste programs.
- UMA Engineering Pacific, Inc. Began in Portland, Oregon as a joint venture which became wholly owned in 1972. UMA E.P.I. acts as a consultant to the feed and seed industry and on aquaculture.
- UMA Engineering Midwest Incorporated is an urban development oriented organization in Peoria, Illinois.
- Interior Engineering Services Limited, Kelowna, B. C. is a municipal engineering and surveying organization which also became wholly-owned by the UMA Group in 1972.

In a speech prepared recently for delivery to various branches of the Canadian Mining Industry, Dr. A. E. Moss, Director of Mining for the UMA Group, discussed various aspects of the Tar Sands of Northern Alberta.

JUN 11 1973

The development and exploitation of these deposits will have a tremendous economic and social impact on the economy of all Canada. Capital expenditures required to design, construct and equip the various facilities for the mining and processing of the deposits will be measured in billions of dollars. However, development of this great oil resource will assure Canadians of an ample supply of energy to meet their requirements for the foreseeable future, Dr. Moss said.

There are three major tar sands deposits, with a total area of about 12,000 sq. miles - or about 5 percent of the total area of the Province of Alberta. The Athabaska Deposit is the largest and makes up 88 percent of the total. The other deposits are the Grand Rapids and the Bluesky-Gething Deposits.

Great Canadian Oil Sands is now operating a plant near Fort McMurray to recover the bituminous impregnated sands for processing. It is using open pit mining methods, which will also be used by the Syncrude Project. However only 15 to 20 percent of these deposits can be mined by open pit methods, so several in situ pilot plants are testing techniques to determine the best method of recovery for the remainder of the deposits.

Dr. Moss says that development of the bituminous sands is now entering a new and exciting era. Conventional petroleum reserves in established oil fields on this continent are in-

sufficient to supply demand beyond the next few years. During the past few months Great Canadian Oil Sands has been operating their plant successfully and Syncrude Canada Limited has been authorized to construct and operate a much larger plant which will produce 125,000 bbls. per day. Several major petroleum companies are currently spending millions of dollars for drilling, operation of pilot plants, feasibility studies and research on various leases in the Fort McMurray area. The capital cost of Syncrude's projected plant and supporting facilities will probably exceed one-half billion dollars. And future plants will likely be as large, or larger, than Syncrude's.

JUN 11 1973

Dr. Moss suggested that, if five new plants, only slightly larger than the proposed Syncrude plant, were to be built in the next fifteen years at a cost of about \$3 billion, there would be sufficient reserves from presently known recoverable sources to last over 850 years!

Dr. Moss is optimistic concerning the future of the Alberta bituminous sands but feels that other capital needs in the country (such as the James Bay project in Quebec), government taxation policies, economic viability, government concern to protect the environment and availability of various highly skilled construction personnel in the right place at the right time will all be factors that will influence the timing of the development.

AR36

JUN 11 1973



GRADICON DIGITIZER COUPLED TO
STEREOMETROGRAPH PLOTTER

JUN 11 1973

Canada leads in photogrammetric mapping. Maps of the future are here to-day. According to Don Porter, General Manager of Western Photogrammetry Limited, his company is in the forefront using the new technique. JUN 11 1973

The company is using Canadian equipment, designed and produced in Canada by Instronics Limited. The unit is known as a Gradicon digitizer which converts graphic information to digital information. This is coupled to a stereometrograph plotter. Back-up software written in Fortran is available.

One of Western's largest clients has a semi-automatic large scale mapping system in full production. This system makes use of magnetic tape. Western Photogrammetry is believed to be the first company to supply this tape with map information recorded in X, Y, Z co-ordinates, which is then refined for use on a flat bed plotter. Any by-product of the MAP can be produced to the user's scale, content, density, symbol, perspective, area and media specified. The possibilities for increased production in engineering offices are tremendous while the implications of this change are somewhat alarming.

It could mean that all existing mapping or plans would become obsolete; that all pencilled manuscripts produced by conventional means would be obsolete and that the introduction of automated techniques will lead to a major re-alignment and re-training of people in the map-making process.

For the future, Mr. Porter sees participation in a Central Data Bank with input and use by many other disciplines and agencies as well as the engineering profession.

The Provincial Government is now building a data base. The next step would probably be the accumulation of property information gathered from surveyors and overlaid on this base.

A proposal for a Central Survey Authority for Metropolitan Toronto is also now being considered. It would be a central information agency for the City and all Boroughs, with each member providing input and utilizing the compiled data.

The concept would be of immense benefit to sociologists and planners as well as to engineers. The speed, precision and flexibility of use excites the imagination.

JUN 11 1973

Western Photogrammetry Limited, one of the UMA Group of companies, with production offices in Rexdale and Edmonton and sales offices throughout Canada, feels that this MAP of to-morrow is already here to be supplied to their clients to-day.

D. G. PORTER

Don Porter is General Manager of Western Photogrammetry Ltd., a subsidiary of the UMA Group.

JUN 11 1973

EXPERIENCE:

1971 - Present - General Manager of Western Photogrammetry Ltd., a subsidiary of Underwood McLellan & Associates Limited, with special responsibilities for increasing service capabilities.

1970 - 1971 - Joined Western Photogrammetry Ltd. as Manager, Eastern Region, responsible for operations, sales, public relations and personnel.

1968 - 1970 - With International Mapping Services Limited, Toronto, Ontario, as Vice-President and General Manager responsible for developing the photogrammetric and photo laboratory aspects of the business. Primary responsibilities were sales, estimating, personnel and production facilities of the company which employed approximately 40 people.

1967 - 1968 - With Cementation Company of Canada Limited, Toronto, Ontario, as Industrial Relations Manager, responsible for the labour relations of the company in Canada and the United States involving union negotiations and arbitration hearings. He was also involved in contract negotiations and special projects concerning diversification of company interests.

1959 - 1967 - With Spartan Air Services Limited, Ottawa, Ontario, as Manager, Photogrammetric Department, responsible for production, quality control, personnel and estimating. The major project during this period was the production of 1:50,000 maps of Tanzania for the Canadian International Development Agency. From January 1964 to June 1965 was Senior Project Manager responsible for the production of a major air photo interpretation, census and land classification contract covering the southeast quarter of Iran for the American Army Map Service.

1949 - 1958 - Was with Photographic Survey Corporation Limited, Toronto, Ontario, as surveyor, party chief and later assistant chief surveyor.

1947 - 1949 - With the Department of Highways, Toronto, Ontario, as surveyor.

(OVER)

D. G. PORTER (Cont'd)

EDUCATION:

Topographical and Legal Surveying Courses, Ontario Department
of Highways.

Photogrammetry Course, U. of Toronto Extension.

AFFILIATIONS:

Member, Canadian Institute of Surveying.

Member, American Society of Photogrammetry.

AR36



The UMA Group A Corporate Profile

Underwood McLellan & Associates Limited

JUN 11 1973

A firm does not become a recognized leader within industry, its profession and the community without a purpose.

Introduction



What makes a firm a recognized leader, an average firm just average? Is it the principals? Or, is it staff? Perhaps youthful energy and imagination. Perhaps older experience and careful consideration.

People.

The engineering profession, perhaps more than any other type of business, has depended almost exclusively on people. People developing new technologies. People solving problems, People interpreting and communicating.

People. The UMA Group.

As the word group suggests, there are many disciplines within the UMA family. All are specialists within respective activities. All are dedicated to integration of services towards meeting a client's total problem or opportunity.

More to point, there are more than 900 consulting engineering firms operating in Canada, with perhaps half as many foreign companies exporting their services to Canada. And when management asks, "Which consultant should we use?" they should be asking, "Which consultant meets our total needs?"

The following report details the UMA Group's overall character but also offers a glimpse of the individuality that sparks a people-oriented firm. Its purpose is to acquaint you with company development, organization depth, ability and, of course, what the UMA Group thinks.

To have an overall knowledge of the UMA Group is to know its fundamental concepts . . . its approach to client service. Basically, the UMA Group believes a professional service can only be purchased from someone capable of rendering the service. Simple and effective.

UMA Development



More than 60 years in operation a staff of more than 350 across Canada equivalent annual construction value of projects in the order of \$80,000,000 to \$100,000,000 An average of 60 new projects per month 100 percent Canadian owned by its employees.

Do such facts tell all?

They don't relate the fact, for instance, that the UMA Group was one of the first consulting firms to work in Northern Canada and whose winter construction techniques are being followed elsewhere. Or, that the firm has utilized the most advanced theories in modern era bridge design. Or, that the UMA Group is aggressively exporting capabilities to foreign countries.

Nor do such facts reveal that UMA Group growth began accelerating rapidly in the mid-1950's shortly after becoming employee-owned. Facing the challenge of change, diversification became an important long-term development policy. It continues to be.

With new horizons came new specialists. New expertise. Transportation, planning, industrial-commercial and recreation people. Top capabilities in earth resources, project management, water resources and pollution control were added. Experienced management co-ordinated the specialists. An indication of the firm's success? Fifteen years ago annual work volume of about 97 projects. Today, more than 700 projects annually.

But while UMA is justifiably proud of the large-scale projects that it now becomes involved in, it is even more proud of a continuing service on smaller projects. A base it built from. A base it must retain.

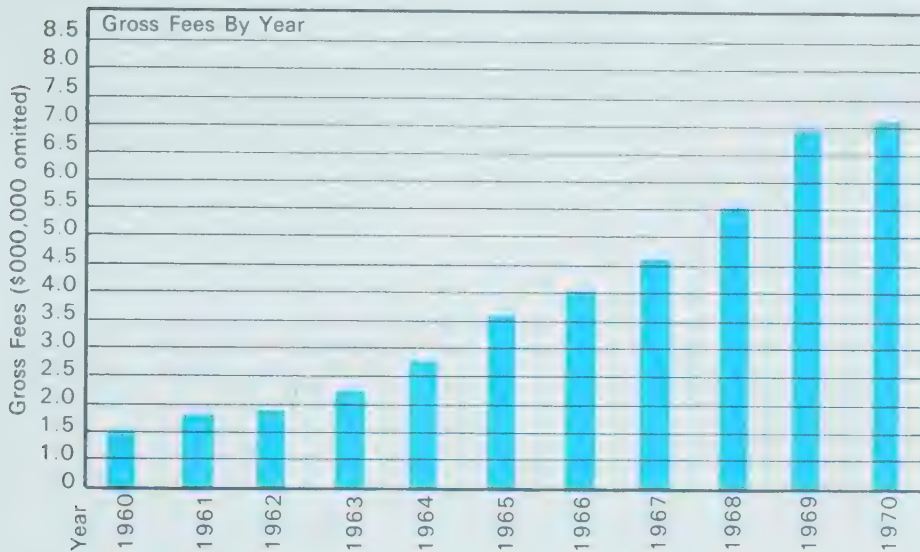
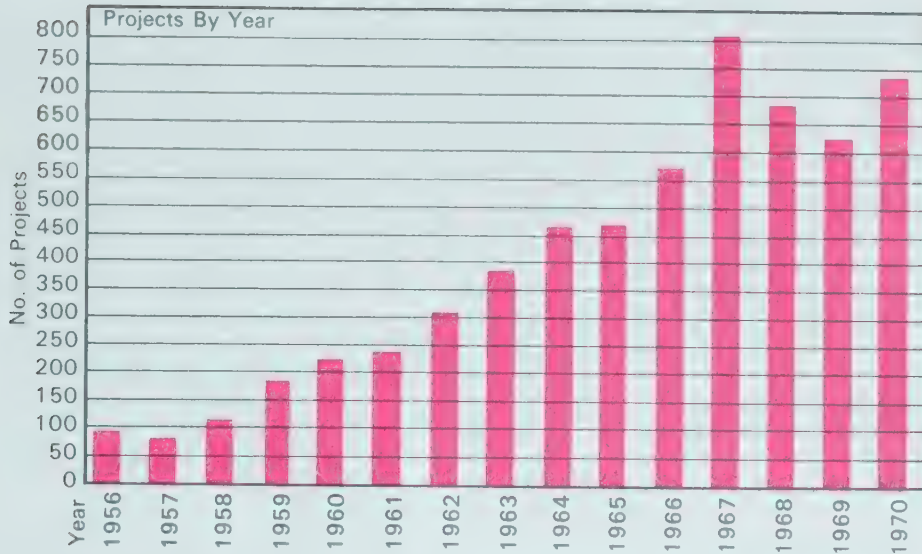
In the past 15 years the Group has served more than 1,400 clients and has been involved in more than 6,500 projects. Facts to point up a strong UMA-client relationship and also that today's clients require not just one service, but an integrated problem-solving team approach.

As a matter of interest, more than 75 percent of UMA projects involve two or more disciplines working together. In many cases, the firm has gone beyond its own structure to form consortiums or associations with other leading professional groups.

Today UMA Group operations are structured into a three-tier organization. At the centre; a corporate office providing long-term planning, business co-ordination and development aid, policy structuring and research assistance. At the provincial level; autonomous headquarters providing specialized services to regional or geographical demands. At the local level; field operations to provide immediate service to clients. Whether it be on the Caribbean Island of St. Vincent; the permafrost areas of the Northwest Territories; or providing municipal services to the rural centres that dot Western Canada.

The UMA Group has developed since 1911.

UMA Operations



An important characteristic of any company, large or small, is its ability to perform with efficiency and stability within the marketplace. In this day of direct dialogue and disclosure, both buyer and seller are asking to know more about the other.

The UMA Group is not a public company, but it believes disclosure of certain information is the first step towards a strong client-consultant relationship.

Prior to UMA diversification in the mid-1950's, for instance, municipal work accounted for almost 100 percent of company fees. Since that time, sales volume has increased more than 10 fold and today municipal engineering represents 35 percent of total fees. Through new disciplines and increased

capabilities, UMA was able to diversify and successfully compete for larger and more complex projects. This did not, however, affect the firm's attitude towards small projects which still account for most consulting services.

UMA Group believes the illustrated charts portray a balanced and imaginative growth pattern. For instance, the company's annual increase in number of projects since diversification has averaged more than 17 percent each year. The UMA Group annual increase in gross fees has held consistently within the same pattern.

The illustrated charts clearly indicate that stability and credibility provide important foundations for continuing growth and development.

Partial List of Clients



Ashland Oil Canada Ltd.
 B.A.C.M. Limited
 Boise Cascade Building Co.
 Calvert of Canada Limited
 Canada Cement Lafarge Ltd.
 Canada Wire and Cable Company,
 Limited
 Canadian Pacific Railway Company
 City of Calgary
 City of Drumheller
 City of Duncan
 City of Edmonton
 City of Medicine Hat
 City of Prince Albert
 City of Regina
 City of Saskatoon
 City of Sudbury
 City of Thompson
 City of Toronto
 Cochrane-Dunlop Hardware Ltd.
 County of Lethbridge
 Douglas Aircraft Company of Canada
 Ltd.
 Eastern Irrigation District of Brooks,
 Alberta
 Federated Co-Operatives Limited
 General Motors of Canada, Ltd.
 Georgian Bay Regional Development
 Council
 Government of Canada
 Department of Indian Affairs and
 Northern Development
 Government of the Northwest
 Territories
 Hudson Bay Mining and Smelting Co.
 Limited

International Nickel Company of
 Canada, Limited
 Manitoba Hydro
 McIntyre Porcupine Mines Ltd.
 Metropolitan Corporation of Greater
 Winnipeg
 Ontario Water Resources Commission
 Province of Alberta
 Department of Public Works
 Province of Alberta
 Department of Lands and Forests
 Province of British Columbia
 Province of Manitoba
 Department of Public Works and
 Highways
 Province of Newfoundland
 Fisheries Development Agency
 Province of Saskatchewan
 Highways and Transportation
 Department
 Rural Municipality of Fort Garry
 Saskatchewan Power Corporation
 Saskatchewan Telecommunications
 Shell Canada Limited
 Telesat Canada
 Town of Assiniboia
 Town of Meadow Lake
 Town of Provost
 Town of High Prairie
 Town of Sparwood
 Town of Stettler
 University of Calgary
 University of Manitoba
 Vancouver Wharves Ltd.
 Westfair Foods Ltd.

Transportation



Very few industries or services have had such a profound affect on the development of nations and cities, as transportation. Through history, transportation has remained a catalyst to change.

In the early 1960's the UMA Group initiated activities to broaden and strengthen its transportation capabilities. Today, a central core of specialists provide services to clients across Canada. Involved in some of the most unique grade separations and structures

in North America, this central core has enabled a continuous technical growth within UMA.

The transportation services available from the UMA Group include:

- Urban transportation planning and parking studies
- Highway, railway, and pipeline location studies
- Planning and design of highways, bridges, transit facilities, and airports
- Traffic engineering



Increasing service requirements by industry and residential areas, together with economic pressures for future growth are influencing the planning objectives of municipal governments.

Since UMA was founded in 1911, it has provided consulting services to both large and small municipalities. It has, perhaps more than any other consultant, helped develop the municipal engineering industry in Western Canada. Because of its integrated disciplines, UMA has brought a wide-range of services to civic administrators and officials. The firms municipal cap-



abilities include:

- Water supply, treatment, storage and distribution
- Industrial and domestic waste water collection, treatment and disposal
- Municipal streets
- Municipal buildings
- Storm water collection and disposal
- Solid waste collection and disposal
- Municipal finance and capital budgeting

The UMA Group views municipal services as the ongoing foundation of company activities and is continually upgrading and developing new expertise in this area.

Municipal

Photogrammetry



Photogrammetry is the science of obtaining precise measurements from photographs and is recognized by leading planners, developers, and engineers as the most economical and efficient method of producing accurate topographic and planimetric maps.

Western Photogrammetry Ltd. is an important part of the UMA Group and is one of the few photogrammetric firms having a direct relationship with a widely diversified engineering operation. With first order facilities in both Eastern and Western Canada, interna-



tionally experienced staff, and photogrammetric engineering expertise, Western Photogrammetry Ltd. offers such services as:

- Digitized mapping
- Ground control surveys
- Intermediate scale mapping
- Large scale design mapping
- Aero triangulation
- Air photo interpretation
- Route location and analysis
- Special projects

Photogrammetry: the direct and economical route to engineering design.

Planning



In very few UMA Group activities does the total-approach concept become more valid than in planning. With populations gravitating towards major urban centres, with society gaining more and more leisure time, and social and cultural values becoming more fully appreciated, planning will play an expanding role in the future of Canada. The UMA Group planning activities are varied:

- Urban land use planning
- New town planning
- Tourism and recreational planning and design
- Regional planning
- Market analysis and feasibility studies

Site selection and design
Landscape architecture
Economic base studies
Services to Canada's Native Peoples
UMA was one of the first consultants to realize the importance of planning functions when it established the UMA Group's Planning Division more than 15 years ago. Whether the project is a small site design, a total community development, or industrial expansion in rural, urban or northern regions, UMA's experience and total-service approach is designed to satisfy users requirements and the highest overall community standards.

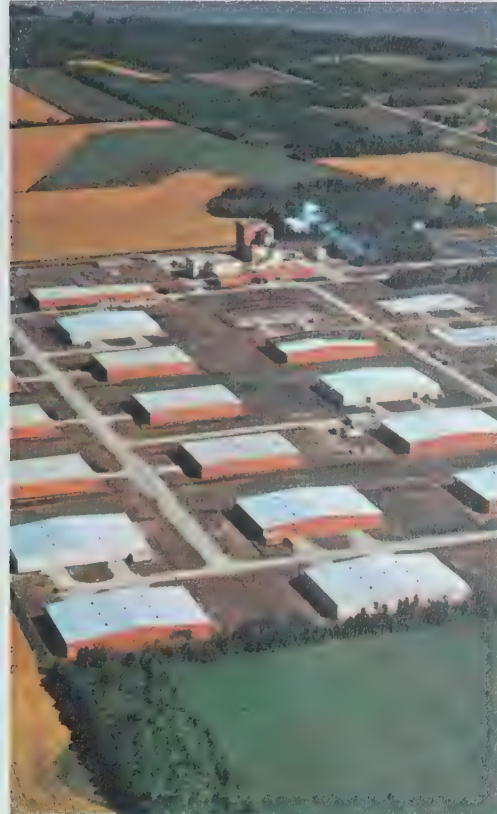
Project Management

There are an estimated 17,000 corporate bodies in North America just beginning to consider construction expansion. But of those companies which decide to build, how many executives on the day of completion can say, "it's on schedule, within the budget, and functionally fulfills all of our requirements."

Whether a major resource development, a new institutional building, or a whole new townsite, questions relating to land, feasibility, financing, schedules, budgets, construction contracts and legal problems are all critical factors. This potential nightmare of construction problems can be handled effectively.

Spantec Limited, a wholly owned project management specialist of the UMA Group, believes real cost savings can best be realized by controlling the development of the project from concept to completion. This philosophy sets the firm apart from other specialists who believe that only the ability to estimate costs can in itself, produce savings.

Industrial Commercial



What is practical? What is functional? What is within the client's limitations from both the short and long term point of view? These are prime questions which the UMA Group must answer before a meaningful relationship is established between client and consultant.

The UMA Group Industrial-Commercial division has provided a complete range of services and building systems to industrial, commercial, government, recreational, and institutional clients from the east coast to the west coast of Canada.

These services include:

- Market studies

- Feasibility studies
- Facility location investigations
- Plant layout
- Soils
- Structural and foundation design
- Heating, ventilation, air conditioning, and refrigeration
- Materials handling
- Piping systems
- Controls
- Process layout and selection
- Equipment evaluation
- Purchasing
- Electrical lighting
- Power distribution systems and motor control
- Contract administration
- Construction management

Land Development



The demands for housing, as well as commercial and industrial growth are increasing each day with the private development industry and municipal governments required to provide the highest level of services available. Instant communities are required for large-scale resource developments in isolated areas of Canada. Mobile home living is meeting with increased acceptance and requires additional planning and design capabilities.

With long experience in land development, the UMA Group's total-service capability has earned the firm high regard within the industry. Participating in major projects throughout Canada and parts of the U.S.A., the firm has brought its capabilities in Photogrammetry, Planning, Municipal Engineering, Building Systems, and Project Management to bear on client problems and objectives.

Northern Development

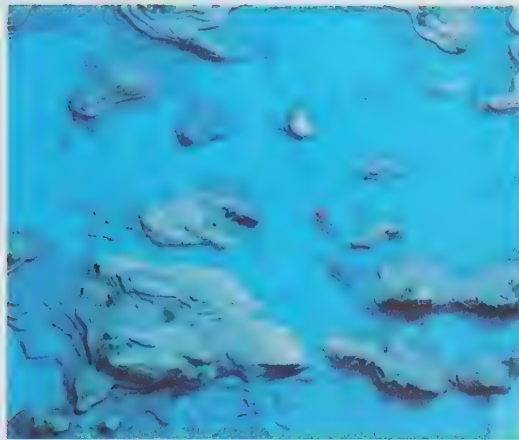


The multi-racial structure of northern society will dictate the methodology of development in the North. People. An estimated 55 percent of Canada's mineral resources, 50 percent of Canada's recoverable conventional oil reserves, and 60 percent of Canada's freshwater is located in the North. Potential.

The North is a vast, sparsely populated area, requiring continual evolution of governmental responsibilities. As a major independent Canadian consulting group with an extensive background of experience in the North, the UMA Group is vitally concerned with existing

and future development of this last frontier of challenge. People. Potential. Problem. The UMA Group experience in the North has crossed all discipline boundaries including:

- Transportation
- Municipal
- Project Management
- Industrial-Commercial
- Photogrammetry
- Earth Sciences
- Water Resources
- Planning
- Pollution Control
- Land Development
- Services to Resource Industries
- Surveying



Pollution, erosion, flood destruction and resource depletion are confronting us with intolerable future consequences.

The water resources division is a specialty function within the UMA Group.

Capabilities within the division include:

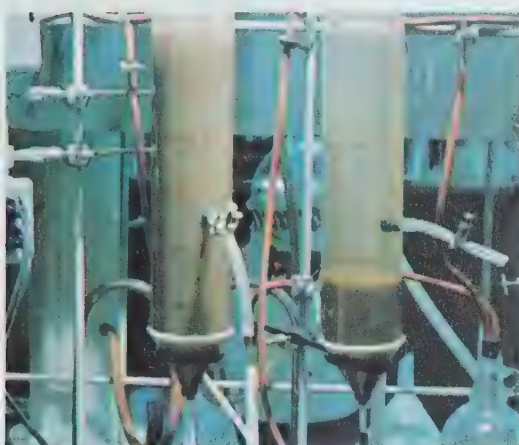
- River basin studies
- Hydro-electric planning and design
- Hydraulic structures, planning and design



- Hydraulic studies
- Hydrological investigations
- Irrigation
- Environmental studies

Past clients have been conservation authorities, land reclamation authorities, electric utilities, all levels of government, and resource industries such as pulp and paper.

Water Resources



Pollution is a threat to the whole. Good intentions not enough.

Part of the problem is recognition of an individual's or a company's responsibility to the whole. Cost is another major consideration; whether it be for preventive or corrective action. For instance, the bill for cleaning up the pollution problem of one of the world's largest nations during the next five years is: \$29 billion for lakes and streams, \$15 billion for air, and \$15 billion for solid waste removal.



Pollution Control

UMA has been involved in various forms of pollution control since the early 1900's when it designed sewage treatment plants. It is now geared to serve industry and government with:

- Air pollution investigation and control
- Water pollution investigation and control
- Solid waste pollution investigation and control
- Treatability studies
- Research services
- Process engineering

A total problem. A total service.

Earth Sciences



The earth sciences services of the UMA Group are directed towards two distinct functions:

- The evaluation of soil and rock properties for engineering purposes.
- The exploration for and development of earth resources.

Evaluation of soil and rock properties is a major function of the division. However, with increasing exploration and development capabilities, the earth sciences group provides services to clients in the fields of groundwater development, construction material searches, and mineral exploration and development.

Surveying

Surveying is the first step in the project phases of planning, design, and construction. It is also a requirement for land control schemes. In recognition of these requirements, the UMA Group maintains a strong survey capability which is offered as part of its overall services or as an individual service on specific projects.

Specialized services include:

- Control surveys for resource development, photogrammetric mapping
- All types of legal surveys
- Construction surveys



Services to Resource Industries



The ability ...

- to respond quickly and completely to a client's need for immediate services and consultation.
- to locate individuals or complete teams of UMA staff on projects at remote or isolated resource sites.
- to complete resource assignments efficiently and economically.

These are the demands of the coal, forest products, petroleum, and mining industries which are met by the UMA Group.

UMA Staff are intimately familiar with the needs of specific resource industries because of significant experience in these areas. This experience enables the UMA Group to tailor its services to specific needs.

UMA People



UMA people have a wide variety of backgrounds. Most have been recruited because of recognized talents, and as with any forward-looking company, UMA Group is constantly searching out new capabilities to support its total integration philosophy.

Over the 60 years of operation, the Group has distinguished itself in being able to retain a sound relationship with staff members and also in retention of senior personnel. UMA is also proud of its former employees, many of whom now occupy senior positions in government and industry.

UMA people are active people. Active as board members and executives in community activities. Active in spearheading national professional associations. Active in heading up provincial professional associations. Active in the education framework of Canada. Active because the UMA Group staff is mobile and can be located on projects around the world.

UMA people are conscious of changing requirements. An average of 35 staff members upgrade their capabilities each year through various educational institutes. Because education is a major influence on future technologies, UMA

Group has awarded more than 60 bursaries to promising students. During the same time, it has brought on staff a minimum of 75 new graduates.

Who are UMA people?

Professional Engineers. Chemists. Economists. Geologists. Technicians. Typists. Computer Programmers. Chartered Accountants. Planners. Conservationists. Architects. Estimators. Photogrammetrists. Surveyors. Administrators. Draftsmen. Soils Technicians. UMA People.

UMA and the Future



Who must know ...

... of new concrete pipe techniques being developed in Australia ... that Japan has 80,000 and Russia 150,000 new engineers per year and that Canada's technological development must somehow keep pace ... that by 2000, more than 80 percent of Canada's total population will live in larger urban centres and require services unimagined by society today ... or that 77 of the 115 countries with populations over 1,000,000 have annual per capita incomes of less than \$500 and that Canada's professions will play a major role in their development.

Who must know ...

No single force has, or will have, a greater impact on the day-to-day happenings of every world inhabitant than engineering. A cradle-to-grave concept and responsibility.

Engineers today are not only affected by changes from within, but from without. There is a deep anxiety with the effect of technology on the environment and suddenly the engineer finds public trusts shaken. While respected as a builder, traditional efficiency and cost-saving are being balanced against other values.

The engineer's future role will be determined to a large extent by his ability to respond to rapidly changing technologies – new computer applications for example – and by his flexibility to adapt these technologies to an increasingly complex society.

The UMA Group is aware of and appreciates the future. In themselves, two important steps toward the future.

The future. UMA philosophy.

The two are inseparable.

The UMA Group believes in:

- complete integration of disciplines and professions towards total-problem solutions. Responsibility.
- seeking out exceptional expertise and giving these talents a challenge and a future. People.
- a physical presence in existing and potential markets across Canada and in foreign countries. Service.
- planning and development towards both short and long-term objectives. Awareness.
- accountability for all actions and results of its staff and services. Credibility.

People, Responsibility, Awareness, Service and Credibility.

HEAD OFFICE:

920 Avord Tower,
Saskatoon, Saskatchewan

EXECUTIVE OFFICE:

1479 Buffalo Place,
Winnipeg, Manitoba

AREA OFFICES:

British Columbia:
2300 Boundary Road, Vancouver

Alberta:
2540 Kensington Road N.W., Calgary
11724 Kingsway Avenue, Edmonton

Saskatchewan:
920 Avord Tower, Saskatoon

Manitoba:
1479 Buffalo Place, Winnipeg

Ontario:
89 Carlingview Drive, Rexdale 605
(near Toronto International Airport)

DISTRICT OFFICES:

Yellowknife, N.W.T.
Lethbridge, Alberta
Drumheller, Alberta
Regina, Saskatchewan
North Battleford, Saskatchewan
Nipawin, Saskatchewan
Meadow Lake, Saskatchewan
La Ronge, Saskatchewan
Brandon, Manitoba
The Pas, Manitoba
Thompson, Manitoba
Victoria, British Columbia

UMA Offices

WESTERN PHOTOGRAMMETRY LTD.

89 Carlingview Drive, Rexdale 605
1479 Buffalo Place, Winnipeg
920 Avord Tower, Saskatoon
11724 Kingsway Avenue, Edmonton

SPANTEC LIMITED

2540 Kensington Road, N.W., Calgary
1479 Buffalo Place, Winnipeg
89 Carlingview Drive, Rexdale 605

INTERIOR ENGINEERING SERVICES LTD.

1450 St. Paul Street, Kelowna, B.C.

UMA ENGINEERING PACIFIC, INC.

1500 S.W. First Avenue
Portland, Oregon, U.S.A.

UMA ENGINEERING MIDWEST, INCORPORATED

411 Hamilton Boulevard
Peoria, Illinois, U.S.A.

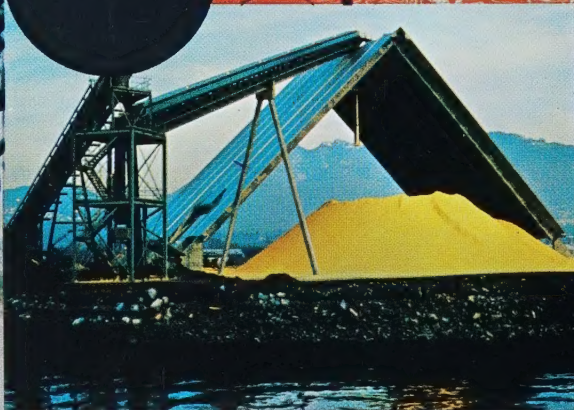
NUTANA PROPERTIES LIMITED

920 Avord Tower, Saskatoon

PROSEARCH LIMITED

89 Carlingview Drive, Rexdale 605

**Associated
Companies**



Feasibility Studies
Economic Studies
Market Analysis
Financial Planning Analysis
Photogrammetry
Conceptual Layout
Field Investigations
Soils Testing
Preliminary Design

Detailed Design
Contract Specifications
Purchasing and Expediting
Construction Supervision
Inspection
Project Management
Community & Recreational Planning
Land Surveys
Sale and Leaseback